Healthy Workplaces Good Practice Awards 2020-2022

CASE STUDY

New operating methods and adapted machinery for preventing musculoskeletal disorders in laundries

AWARDED

ORGANISATION/COMPANY	COUNTRY	SECTOR	TASKS
Servizi Italia Spa	Italy	Activities of industrial laundries / Sterilisation of medical and health equipment	Laundering work, including loading bags for washing, sorting bedsheets and pressing items

Source: Servizi Italia

Background

Servizi Italia has been providing laundry and sterilisation services to the healthcare sector for over 30 years.

The company employs 1,963 workers divided among 9 laundry plants, 19 surgical instruments and textile sterilisation centres, and several wardrobes that are distributed throughout Italy.

The employees carry out activities involving the use of their upper limbs and trunk. These are associated with ergonomic risk factors, such as repetitive movements, awkward postures, use of force and manual handling of loads.

Aims

The company intends to increase the wellbeing of employees by creating more ergonomic workstations and reducing the risk of musculoskeletal disorders (MSDs).

What was done and how?

To conduct the risk assessment, the company decided to use wearable Wi-Fi technology (a wearable inertial system) for computerised analysis of movements and postures at the various workstations. This was done in collaboration with the ErgoCert certification body for ergonomics.

The software used allows the synchronisation of video and quantitative data on movements related to the work cycle, thereby assessing risks. The implemented limits are derived from the ISO 11228 series and ISO 11226. Video data were captured, when possible, from at least two operators per workstation who represented anthropometric extremes and performed the work cycles of interest several times. The analysis covers postures, repetition and duration.

Meetings were also held with the occupational physician and worker safety representatives that included sharing the results of the computerised analyses. They also consulted workers about suggestions for possible solutions and assessed them in collaboration with the production managers and the head of prevention.

Various changes were introduced, involving 17 production sites and 60 employees. The solutions comprised technical and organisational measures and training.

Three representative cases of the intervention:

Case 1: Introduce a bench for loading bags for washing

PROBLEM: Double lifting of laundry bags to be emptied onto the washer-extractor loading belt; lifting arms while shaking bags to release the contents.

Computerised analysis: Use of the shoulder for about 3% of the time above 80°, but for almost 15% of the time between 60° and 80°; repeated unsupported flexion of the trunk greater than 60°.

SOLUTION: Introduction of a bench on which to place the sacks when sorting the laundry. Trolleys were positioned to the side so the sacks dropped higher up on the bench and not behind the worker. Bags are now sorted when placed on a bench and not after they have been emptied. Workers are given on-the-job training sessions on the correct positioning of the trolley and instructed to use both upper limbs, not always the same one, when carrying out their tasks. Where necessary, the depth of the load compartment was increased, and progressive belt advancement was implemented.

Case 2: Raise conveyer belt height for manual sorting

PROBLEM: Sorting task involved raising arms according to the size of the (bed)sheets and the height of the sorting belt.

Computerised analysis: Use of raised shoulder and elbow for about 5% of the time; unsupported flexion of the trunk that increased in number and frequency.

SOLUTION: The height of the belt was raised by 10 cm to minimise bending of the shoulders and back, while automatic sheet unravelling systems and conveyor systems were introduced for moving the laundry items. Sorting trolleys were repositioned to reduce the distance items need to be thrown and arranged according to the item's frequency. Workers also rotate among four workstations. They also receive on-the-job training. For example, workers are instructed to use their elbows more than their shoulders.

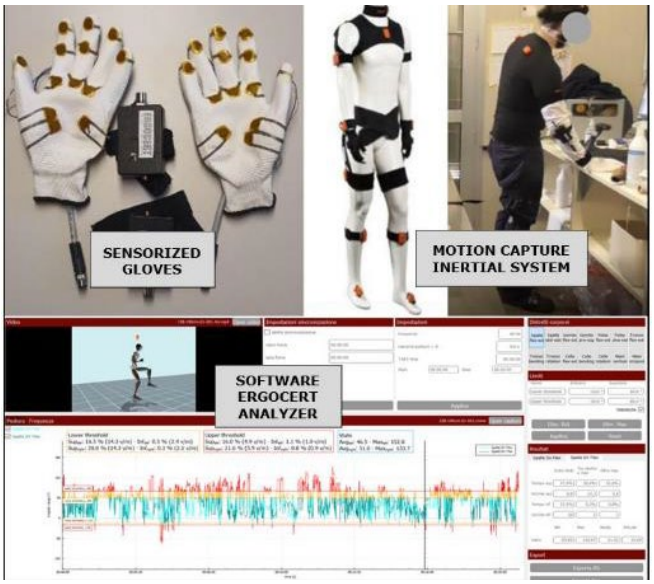
Case 3: Adjust the trouser press

PROBLEM: Ironing trousers has a cycle time of 7-12 seconds and involved raising shoulders in a constrained position and bending the back.

Computerised analysis: Many female workers below 160 cm in height spent about 15% of the cycle time with arms raised above 80°; flexion of the lumbar spine greater than 20°.

SOLUTION: The company collaborated with the machinery manufacturer to find a technical solution for adapting the trouser press and eliminating the need for working with raised arms that included lowering the point where the trousers are inserted. Photocells were installed to replace the manual operation of a double control. Workers are rotated between loading and bending stations and are given on-the-job training. Other training in work methods covers folding cleaned laundry items and loading them onto trolleys ready for transportation.

What was achieved?



Source: Ergocert

A 'dashboard' was developed for the occupational physician, summarising the assessments carried out and enabling better monitoring of physical fitness to work, limitations and task assignments.

In particular:

Case 1: Loading bags for washing

Limiting shoulder elevations to below 5% of the cycle time and reducing the workload by half. Reduction in trunk overload associated with bending and twisting.

Case 2: Manual sorting belt height

Eliminating shoulder elevation, reducing force peaks and overload balancing. Limiting bending of the back.

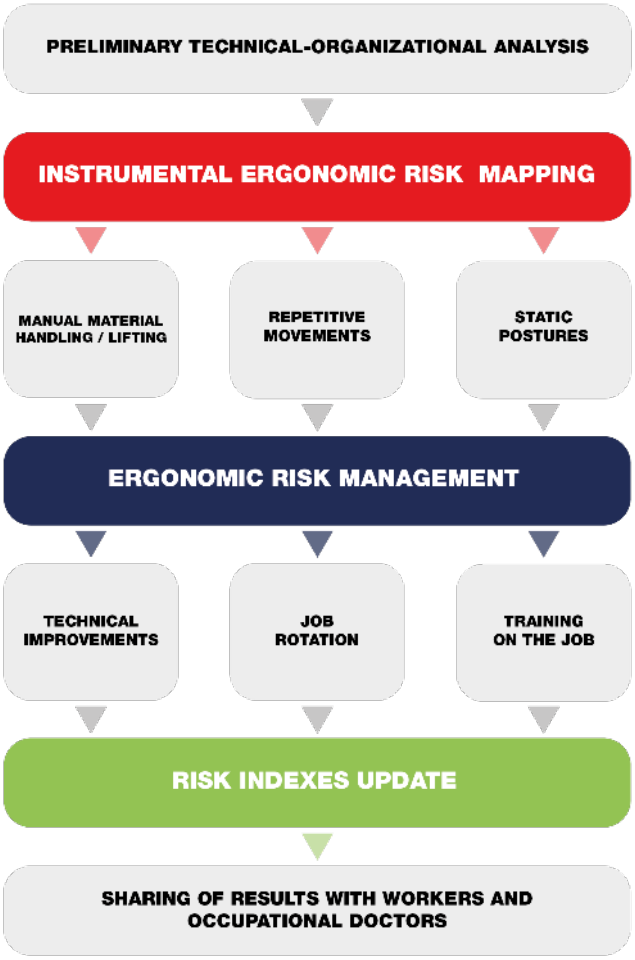
Case 3: Adjustment of the trouser press

Eliminating the need to raise arms beyond 80° and reducing those exceeding 60° from 30% to 7%, and minimising flexion of the lumbar spine beyond 20°.

On-the-job training enabled the collection of additional suggestions for improvements.

Success factors

- A combination of technical and organisational adaptation was used.
- Employees were involved along with the use of technical instrumentation.
- Employees were provided with on-the-job training on how to use the implemented solutions and improved work techniques.
- The inertial system improved the risk assessment by enabling precise identification of the riskiest elements of the tasks.



Source: Servizi Italia

Transferability

The general approach to solutions is widely applicable. The use of a wearable inertial device to measure movement and posture could be adopted by a wide range of companies as a means of risk assessment and monitoring. The aspects of worker involvement are also applicable to different types of work.

Costs and benefits

- Ergonomic improvements led to the reduction of loads on the body.
- The benefits were objectively documented by data from the inertial system and computerised analysis of movement and posture.

Key features of good practice example

- A mix of solutions were used, including work equipment and layout changes to eliminate risky postures, task rotation and training in work techniques.
- The use of an inertial system for computerised analysis of movement and posture to pinpoint the riskiest factors and to reassess them after the implementation of ergonomics interventions is very useful. It not only enables accurate assessment of the interventions but also facilitates continuous monitoring of employees' postures and movements.
- Through the risk assessment process, workstations and equipment predominantly used by women were adapted to their body size.
- Worker involvement allowed validation of the technical assessments and was important for determining solutions.
- The results of the assessments were also summarised to create a tool to better assess workers' capability in carrying out the different tasks.

Further information

Further information can be found at https://www.servizitaliagroup.com

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